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APPENDIX V

(Vide "Communications to the Council" at page 60 supra.)

**CAUVERY (METTUR) PROJECT—PROGRESS REPORT
FOR THE FINANCIAL YEAR 1925-26.**

FINANCE DEPARTMENT.

In view of the magnitude of the Cauvery (Mettur) Project, the Government consider it advisable to keep the Finance Committee and the Legislative Council informed every year of the progress made in the previous official year in the operations connected with the project. The Chief Engineer's review below which covers the progress made in the official year 1925-26 was circulated to the Members of the Finance Committee on the 10th February 1927. The papers are placed on the table for the information of the Members of the Legislative Council.

G. T. BOAG—8-2-27.

*Chief Engineer's Report, dated 1st September 1926—
Cauvery (Mettur) Project.*

1. *Head Works.*—During the year under review preliminary and preparatory works in connexion with the project were in progress, such as the construction of a road from Erode to Mettur, arrangements for construction of buildings for providing accommodation for the staff, a bridge over the Cauvery below dam site, collection of sand, investigation of dam lines, and the coffer-dam works, etc. As soon as the Special Superintending Engineer for the project took charge of the circle, he went on a tour to large irrigation works in progress in Northern India, such as the Lloyd Barrage, the Sutlej Valley project, the Nizam Sagar dam works, etc. He also visited the Bombay Development Department, and machinery and tools and plant worth about a lakh and odd were purchased for the project, such as Sentinel steam waggons, steam road rollers, tramway plant, etc.

2. The first necessity was a good road capable of carrying heavy plant and machinery at all times, as the dam site is at a distance of 35 miles from the nearest railway station. A passable road was rapidly made by clearing vegetation, filling up erosions, widening narrow passages, excavating side drains, etc., and steps were taken to convert the road into a first class one capable of carrying heavy traffic such as plant and machinery. An estimate for a 42-foot road with 14 feet metalled portion was prepared and sanctioned and small lengths of road were started and completed during the year.

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3. *Buildings*.—The next important item of work was the provision of accommodation for the staff at headworks. Temporary huts were put up at first. The land required for pucca buildings was acquired and handed over in November 1925, and the work was started departmentally for want of suitable contractors. Earthwork and foundations for three Executive Engineers' quarters were in progress by the end of March. One store shed was erected and another was in good progress.

4. *Cauvery bridge*.—Another preliminary item of work was the Cauvery bridge below dam site. The site had to be changed owing to the change of dam site and work at the new site was started and excavation for foundations was going on by the end of March 1926.

5. *Collection of sand*.—Contrary to expectations large deposits of sand in the bed of the Cauvery river were found quite suitable for use on the dam works. About 103,286 cubic feet was collected before the end of the year. Arrangements are under way to collect all the sand that will be required for the dam in two or three years and it is hoped that this will effect a saving of about 20 lakhs.

6. *Collection and test of materials*.—Investigation of lime stone deposits available in the vicinity and collection of samples of lime available in various quarries were begun. The lime stone quarries in the neighbourhood of the dam site were found to contain very little lime, with a heavy overburden of earth, and hence the full quantity required for the dam had to be sought further afield. The Assistant Director of the Geological Survey of India inspected the site for the dam and the various lime stone quarries and found a few good quarries around Sankaridrug, about 40 miles from the site of dam. But the question whether lime or cement should be used in the construction of the dam with reference to their relative cost is not yet decided, as it has not yet been ascertained whether sufficient quantities of lime can be found within a reasonable distance from the dam.

7. *Investigation of the dam line*.—Mr. Stoney, when Superintending Engineer, considered that another line about a mile north of the sanctioned dam line would be more advantageous, as it affords better surplusing facilities for such floods as that of 1924, and trial borings were made with calyx drills to locate the depth of rock under ground. Dr. Smeeth, lately of the Mysore Geological Department, was invited by the local Government to offer his remarks on the new dam line. Both Dr. Smeeth and Mr. Vinayak Rao of the Geological Survey of India, who came to inspect the lime stone quarries, confirmed the opinion of Mr. Stoney that the second line would be more advantageous than the first. Trial borings were continued along the new dam line.

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8. *Coffer dam*.—During the inspection by the Chief Engineer for Irrigation, in March 1926, it was ordered that the coffer dam should be put up on the right half of the bed of the river. Preliminary works were immediately started, but the pumps ordered for the clearance of the soil and sub-soil not having been received, much progress could not be made. However, the north and south side walls were opened out and foundations laid and walls built at the ends close to the bank.

9. *Water-supply*.—The design for permanent water-supply was drawn up and the estimate is under preparation. Meanwhile the need for water-supply for the staff already stationed at Mettur being pressing, temporary arrangements were made by pumping from a good protected well after bacteriological examination. The bulk of the pipes were laid during the year and the other arrangements have since been completed. Revised surveys and levels were taken for the permanent water-supply scheme with reference to the altered dam site.

10. *Sanitation, medical aid, etc.*—The local fund dispensary at Nerinjipet having been closed, there was no medical aid at hand. A portion of the church buildings now occupied by the Stores and Tests Division office was set apart for the hospital. Camps and buildings were started late in the year, and the staff at Mettur were housed in village huts acquired along with the site. Temporary sanitary arrangements, such as construction of movable trench latrines, etc., were made. Public street lights were also provided for the existing temporary huts.

11. *Canal system*.—The main work done during the year was the alignment of canals and channels and demarcating the canals so aligned after submitting preliminary notifications for the lands required. About 51 miles of the Grand Anicut canal and 106½ miles of branch canals and distributaries were aligned during the year.

12. Construction work on some of the inspection bungalows along the Grand Anicut canal and Vadavar system was started during the year. About two lakhs of bricks and 132 units of concrete metal required for some of the masonry works were also collected during the year.

13. For the acquisition of land required for the project works, a Collector was placed on special duty and eight Deputy Collectors were also appointed during the course of the year. The total area acquired for the headworks was 811 acres including 207 houses.

14. *General*.—Generally speaking, progress was slow owing to the numerous initial difficulties encountered and the various modifications of plan found necessary.

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APPENDICES.

I

Abstract statement of expenditure by Minor Heads to accompany the special progress report on the Cauvery (Mettur) Project for the financial year 1925-26.

Minor heads.	Amount of estimate.	Actual outlay to end of 1924-25.	Budget estimate for 1925-26.	Revised estimate for 1925-26.	Actual expenditure for 1925-26.
(1)	(2)	(3)	(4)	(5)	(6)
	IN LAKHS OF RUPEES.	IN LAKHS OF RUPEES.	IN LAKHS OF RUPEES.	IN LAKHS OF RUPEES.	IN LAKHS OF RUPEES.
I. Works—					
(1) Land ...	73.57	...	1.33	2.77	1.90
(2) Other works ...	378.86	0.14	2.50	2.64	1.78
(3) Special tools and plant.	79.83	...	...	2.20	2.97
Total, I. Works ...	532.26	0.14	3.83	7.61	6.65
II. Establishment ...	56.24	...	* 0.97	1.61	1.50
III. Tools and plant (Ordinary).	8.96	...	0.87	...	0.22
IV. Suspense ...	1.42	...	...	...	0.09
V. Deduct receipts on capital account.	— 7.50	— 0.02
Total, Direct charges ...	591.38	0.14	5.67	9.22	8.44

* Pro rata figure.

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II

Detailed statement of expenditure by Minor Heads to accompany the special progress report on the Cauvery (Mettur) Project for the financial year 1925-26.

Minor, sub and detailed heads.	Amount of estimate.	Actual outlay to end of 1924-25.	Budget estimate for 1925-26.	Revised estimate for 1925-26.	Actual expenditure for 1925-26.
(1)	(2)	(3)	(4)	(5)	(6)
I. WORKS.	RS.	RS.	RS.	RS.	RS.
<i>Head works—</i>					
A. Preliminary expenses.	2,50,000	* 13,665	...	15,000	14,354
B. Land (including land acquisition establishment).	26,59,000	...	1,33,000	2,62,100	1,73,794
C. Works ...	2,19,73,600	...	2,50,000	65,000	2,509
K. Buildings ...	11,28,800	...	...	50,000	27,357
O. Miscellaneous—					
(i) Communication.	} 13,55,600	{ ...	...	98,800	1,00,200
(ii) Sanitation ...				500	2,664
P. Maintenance ...	2,16,000	...	...	...	10
<i>Main canals and branches (canal system)—</i>					
A. Preliminary expenses.	1,17,300	...	...	...	1,843
B. Land (including land acquisition establishment).	18,20,900	...	...	15,000	16,260
D. Regulators ...	33,900	...	...	...	26
F. Cross drainage works.	29,04,800	...	...	} 34,500	{ 2,392 6,012 19,326
K. Buildings ...	3,50,000	...	...
O. Miscellaneous ...	1,89,700	...	...
<i>Distributaries (canal system)—</i>					
A. Preliminary expenses.	1,25,450	...	...	...	1,120
<i>Special tools and plant—</i>					
Head works ...	63,55,000	...	...	2,20,000	2,78,208
Canal system ...	16,28,000	...	...	...	19,027
Total, I. Works ...	...	13,665	3,83,000	7,60,900	6,65,102

* This was incurred in 1924-25 under '15' pending sanction to the project under '55'.

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Detailed statement of expenditure by Minor Heads to accompany the special progress report on the Cauvery (Mettur) Project for the financial year 1925-26—cont.

Minor, sub and detailed heads.	Amount of estimate.	Actual outlay to end of 1924-25.	Budget estimate for 1925-26.	Revised estimate for 1925-26.	Actual expenditure for 1925-26.
(1)	(2)	(3)	(4)	(5)	(6)
	RS.	RS.	RS.	RS.	RS.
II. Establishment—					
Head works ...	...	...	...	1,15,100	1,08,350
Canal system ...	...	...	* 97,000	37,300	36,559
Other departments.	...	...	...	9,200	4,960
Total, Establishment ...	...	...	* 97,000	1,61,600	1,49,869
III. Tools and plant (ordinary)—					
Head works ...	5,49,000	...	87,500	...	12,125
Canal system ...	3,47,000	...	...	...	9,782
Total, Tools and plant ...	...	...	87,500	...	21,907
IV. Suspense—					
Head works ...	75,000	...	...	...	8,533
Canal system ...	...	...	...	...	...
Total, Suspense ...	...	...	...	...	8,533
Deduct—Receipts on capital account—					
Head works ...	...	...	...	...	— 1,582
Canal system ...	...	...	...	...	— 190
Total, Receipts on capital account.	— 1,772
Grand total	13,665	5,67,500	9,22,500	8,43,639

* Pro rata figure.

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III

Detailed statement of establishment to accompany the special progress report on the Cauvery (Mettur) Project for the financial year 1925-26.

Minor, sub and detailed heads.	Amount of estimate.	Actual outlay to end of 1924-25.	Budget estimate for 1925-26.	Revised estimate for 1925-26.	Actual expenditure for 1925-26.
(1)	(2)	(3)	(4)	(5)	(6)
				RS.	RS.
Public Works Department—					
Head works--					
Office of the Superintending Engineer.	} 1,08,100	39,243
Office of the Executive Engineer, Construction division.		40,666
Office of the Workshops and Machinery division.		5,973
Office of the Stores and Tests division.		6,755
Office of the Chief Engineer for Irrigation.	} 7,000	1,025
English cost of establishment and loss by exchange.		14,688
Total	1,15,100	1,08,350

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Detailed statement of establishment to accompany the special progress report on the Cauvery (Mettur) Project for the financial year 1925-26—cont.

Minor, sub and detailed heads.	Amount of estimate.	Actual outlay to end of 1924-25.	Budget estimate for 1925-26.	Revised estimate for 1925-26.	Actual expenditure for 1925-26.
(1)	(2)	(3)	(4)	(5)	(6)
			RS.	RS.	RS.
Other departments—					
Head works—					
Forest department	2,560
Medical department	2,400
Total	9,200	4,960
Public Works Department—					
Canal system—					
Office of Engineer-in-charge, No. 1 division.	37,300	36,559
Grand total	* 97,000	1,61,600	1,49,869

* Pro rata figure.

IV

Note explaining the variations of figures in columns (4), (5) and (6) of Abstract Statement I (Appendix I).

	LAKHS.
	RS.
<i>Cauvery (Mettur) Project—</i>	
Budget estimate for 1925-26 ...	5.67
Revised estimate „ ...	9.22
Actual expenditure „ ...	8.44
Difference ...	— 0.78

Budget Estimate and Revised Estimate for 1925-26.—The year 1925-26 was the first year of construction of the project. The programme of expenditure for the year according to the sanctioned estimate was Rs. 12.56 lakhs, but as the entire organization had not been definitely settled, the budget estimate was fixed at Rs. 5.67 lakhs for want of sufficient data to justify a larger provision. The revised estimate will therefore be taken as the basis for comparison with the actual outlay. The total revised estimate and the final grant for the project were the same although there were variations in the details.

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2. As regards the variations between the revised estimate and the actuals, there is a small saving of Rs. 0.78 lakh and this is spread over several items as shown below :—

					LAKHS.
					RS.
I Works—	(1) Land	...	...	...	— 0.87
	(2) Other works	...	...	...	— 0.86
	(3) Special Tools and Plant	...	...	...	+ 0.77
II	Establishment	...	...	...	— 0.11
III	Tools and Plant—Ordinary	...	...	...	+ 0.22
IV	Suspense	...	...	...	+ 0.09
V	Receipts on Capital Account	...	...	...	— 0.02
Total					— 0.78

The variation under each head is explained below separately.

					LAKHS.
					RS.
3. I Works—	(1) Land—				
	Revised estimate	...	...	...	2.77
	Actual expenditure	...	...	...	1.90
Difference					— 0.87

There was some delay in the posting of Deputy Collectors for acquisition of land. Some of the sanctioned staff was not entertained. There was also delay in the acquisition which was expected to be completed before the close of the year and for which appropriations had been reserved. Anticipating some of these events, the final grant was reduced from Rs. 2.77 lakhs to Rs. 2.30 lakhs. There was a further lapse of Rs. 0.40 lakh, the actual expenditure incurred being Rs. 1.90 lakhs. The lapse was also due in part to the system of accounting in vogue under which land acquisition charges were adjusted through the Public Works remittance accounts. The Accountant-General has since issued instructions with a view to avoid this in future.

					LAKHS.
					RS.
(2) Other works—					
	Revised estimate	...	...	...	2.64
	Actual expenditure	...	...	...	1.78
Difference					— 0.86

After the revised estimate was fixed, part of the appropriation was transferred to other heads. The final grant was Rs. 2.09 lakhs. Thus, the difference between the final grant and the actual expenditure was Rs. 0.31 lakh. The question of the change of dam site was raised and was not finally settled before the year closed. This had the effect of protracting all preliminary works, namely, the Cauvery bridge to be constructed near the dam, and quarters for the staff, etc. The major portion of the expenditure, viz.,

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Rs. 1,00,200, was incurred on roads. The outlay on the road from Erode to Mettur was Rs. 92,000 ; Rs. 3,106 was spent on roads in the head works area and Rs. 2,153 on providing coverings for wells.

					LAKHS. RS.
(3) <i>Special tools and plant—</i>					
Revised estimate	...	...	...	...	2.20
Actual expenditure	...	...	...	...	2.97
				Difference	... + 0.77

After the revised estimate was fixed, additional appropriation was sanctioned raising the final grant under the head to three lakhs. The difference between the final grant and actuals was thus only — 0.03 lakh. The lapse was due to the late receipt of certain machines ordered during the year. It was originally proposed to budget for a sum of Rs. 0.87 lakh (the programmed expenditure) under this sub-head, but actually the head III—“Ordinary tools and plant”—was employed, leaving no appropriation under the head “Special tools and plant”. On the recommendation of Mr. Stoney, Superintending Engineer, Cauvery (Mettur) circle, who inspected large irrigation works in Northern India during the year, tramway tracks, sentinel and tipping waggons, road roller, cement testers, etc., on sale with the Bombay Development Trust, were purchased. Also calyx drills for dam line works, air compressors, 600 tons of wrought-iron girders for bridges, etc., were locally purchased during the year. This explains the increase in the revised estimate and the actual expenditure. Details of the plant ordered during the year are given in a separate statement (vide Appendix V).

					LAKHS. RS.
4. <i>II Establishment—</i>					
Revised estimate	...	...	...	...	1.61
Actual expenditure	...	...	...	...	1.50
				Difference	.. — 0.11

The original intention was that the charge for the establishment, amounting to Rs. 0.97 lakh, should be provided as usual on the *pro rata* basis. It was subsequently decided that the actual expenditure under this head should be charged to the project and the revised estimate was thereupon fixed at Rs. 1.61 lakhs. Less than the full sanctioned staff was actually employed, which explains the underspending of Rs. 0.11 lakh.

					LAKHS. RS.
5. <i>III Tools and Plant—Ordinary—</i>					
Revised estimate	Nil.
Actual expenditure	0.22
				Difference	... + 0.22

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The provision of Rs. 0.87 lakh in the budget estimate was really intended for special tools and plant and as charges under this sub-head are booked under works, the provision was transferred to 'Works.' A provision of Rs. 0.22 lakh however was made to meet actual requirements under 'Ordinary tools and plant' after the revised estimate was fixed.

					LAKH. RS.
6. <i>IV Suspense—</i>					
Revised estimate	...	...	...	...	Nil.
Actual expenditure	...	...	...	...	0.09
				Difference	+ 0.09

An expenditure of Rs. 8,533 was incurred on the collection of sand, etc. This was not anticipated when the budget or the revised estimate was framed.

					LAKH. RS.
7. <i>Receipts on Capital Account—</i>					
Revised estimate	...	...	...	...	Nil.
Actual expenditure	...	...	...	...	— 0.02
				Difference	— 0.02

The amount is very small and calls for no remark.

Statement showing the details of special tools and plant, the local purchase of which was sanctioned in 1925-26.

Name of article.	From whom ordered.	Estimated cost (approximate). RS.
1. Sentinel and tipping waggons, steam-road rollers, cement testers, shearing and punching machines, light railway track, etc.	The Bombay Development Trust.	1,61,700
2. Ten-ton road roller	Marshall & Sons, Madras.	9,900
3. Air compressor units for drilling.	Ingersoll Rand, Ltd., Calcutta.	39,600
4. Six-hundred tons of wrought iron girders for bridges.	South Indian Railway Company, Ltd.	85,000
5. One mile of tramway track and 25 tipping waggons.	Parry & Co., Madras.	11,100
6. Eighty-seven steel roof trusses for workshops.	Laxmiratans, Ltd., Madras.	7,000
7. Three Calyx drills	Ingersoll Rand, Ltd., Calcutta.	40,000

It may be taken that items 1 to 4 have been paid for in 1925-26.